

AMENDMENTS TO THE CLAIMS

The following is a complete, marked up listing of revised claims with a status identifier in parentheses, underlined text indicating insertions, and strikethrough and/or double brackets indicating deletions.

Listing of the Claims

1. (Currently Amended) A recording medium including recorded data, comprising:

a control data area including pits formed along tracks, with data recorded therein, wherein pits in some portions of the tracks are formed as wobbled pits, pits in other portions of the tracks of the control data area are formed as straight pits, and the wobbled pits are formed intermittently and alternately with the straight pits within the control data area, wherein control information is encoded along ~~with wobble shapes~~ of the wobbled pits, in such a way that data bit "0" and "1" comprising the control information are represented by a transition within a predetermined period of the ~~wobble shapes~~ wobbled pits and each data bit is distinguished from each other by the transition direction within the predetermined period, and wherein the control data area includes a plurality of data units, and the wobbled pits are formed in at least one data unit preceded by the straight pits or followed by the straight pits.

2. (Currently Amended) A method of forming a recording medium, comprising:

forming pits in a control data area along tracks, with data recorded

therein, wherein pits in some portions of the tracks are formed as wobbled pits, pits in other portions of the tracks of the control data area are formed as straight pits, and the wobbled pits are formed intermittently and alternately with the straight pits within the control data area,

wherein the step of forming pits includes encoding control information along ~~with wobble shapes~~ of the wobbled pits, in such a way that data bit "0" and "1" comprising the control information ~~being~~ are represented by a transition within a predetermined period of the ~~wobble shapes~~, wobbled pits and each data bit ~~being~~ is distinguished from each other by the transition direction within the predetermined period, and wherein the control data area includes a plurality of data units, and the step of forming pits includes forming the wobbled pit in at least one data unit preceded by the straight pits or followed by the straight pits.

3. (Currently Amended) A method of reproducing data from a recording medium, comprising:

detecting data recorded in pits formed along tracks in a control data area, wherein pits in some portions of the tracks are formed as wobbled pits, pits in other portions of the tracks of the control data area are formed as straight pits, and the wobbled pits are formed intermittently and alternately with the straight pits within the control data area,

wherein the step of detecting data includes detecting control information encoded along ~~with wobble shapes~~ of the wobbled pits, data bit "0" and "1" comprising the control information ~~being~~ are represented by a transition within a predetermined period of the ~~wobble shapes~~, wobbled pits and each

data bit ~~being~~ is distinguished from each other by the transition direction within the predetermined period, and

wherein the control data area includes a plurality of data units, and the step of detecting control information includes detecting the wobbled pits from at least one data unit preceded by the straight pits or followed by the straight pits; and

utilizing the control information to reproduce main data recorded with modulation in straight pits formed along tracks of a main data area of the recording medium.

4. (Previously Presented) The method according to claim 3, wherein the step of detecting data comprises:

converting signals reflected from the wobbled pits into electrical signals; and

extracting the control information by applying the electrical signals to a logic circuit.

5. (Previously Presented) The method according to claim 4, further comprising:

reproducing the main data using the control information, and
outputting the reproduced main data.

6. (Previously Presented) The method according to claim 3, wherein the step of detecting control information detects the control information

recorded in pits from a difference signal between a right and a left electric signals, generated by a beam reflected from the pits formed along the tracks.

7. (Previously Presented) The method according to claim 6, wherein the step of detecting data further detects the main data from a high-frequency electric signal generated by a beam reflected from the straight pits.

8. (Cancelled).

9. (Currently Amended) An apparatus for reproducing data from a recording medium, said apparatus comprising:

a detection unit configured to detect data recorded in pits formed along tracks in a control data area, with data recorded therein, wherein pits in some portions of the tracks are formed as wobbled pits, pits in other portions of the tracks of the control data area are formed as straight pits, and the wobbled pits are recorded intermittently and alternately with the straight pits, wherein control information is encoded along ~~with wobble shapes of the wobbled pits,~~ in such a way that data bit "0" and "1" comprising the control information are represented by a transition within a predetermined period of the ~~wobble shapes~~ wobble pits and each data bit is distinguished from each other by the transition direction within the predetermined period, wherein the control data area includes a plurality of data units, and the wobbled pits are formed in at least one data unit preceded by the straight pits or followed by the straight pits, and wherein

the detection unit converts signals reflected from the pits into electric signals; and

a signal processor, coupled to the detection unit, configured to process the electric signals to generate the control information and to process main data recorded with modulation in straight pits formed along tracks of a main data area of the recording medium.

10. (Cancelled)

11. (Currently Amended) The apparatus according to claim 9, wherein the signal processor is configured to generate the control information from low-frequency components and generate the main data from high-frequency components.

12. (Currently Amended) The apparatus according to claim 9, further comprising:

a controller, coupled to said detection unit and said signal processor, configured to control the detection of the control information and the processing of the main data, wherein the controller is configured to control said signal processor to output the main data based on the control information.

13. (Currently Amended) The apparatus according to claim 12, wherein the controller is configured to control said detection unit to detect the control information by a push-pull method.

14. (Currently Amended) The recording medium according to claim 1, wherein the control information includes protection information used for controlling at least one of reproduction and/~~or~~ recording of main data.

15. (Currently Amended) The method according to claim 2, wherein the control information includes protection information used for controlling at least one of reproduction and/~~or~~ recording of main data.

16. (Currently Amended) The method according to claim 3, wherein the control information includes protection information for controlling at least one of reproduction and/~~or~~ recording of main data, and

wherein the step of detecting control information detects the protection information.

17. (Cancelled)

18. (Currently Amended) The apparatus according to claim 12, wherein the control information includes protection information used for controlling at least one of reproduction and/~~or~~ recording of the main data, and

wherein the controller is configured to control the reproduction of the main data in response to the protection information.

19. (Currently Amended) The recording medium according to claim 1, wherein the control information in the control data area is recorded ~~in the wobble shapes of~~ along the wobbled pits while being encoded by bi-phased modulation.

20. (Previously Presented) The recording medium according to claim 14, wherein the protection information is repeatedly encoded in plural arrays of the wobbled pits.

21. (Previously Presented) The recording medium according to claim 1, wherein the control data area comprises arrays of the wobbled pits and arrays of the strait pits periodically.

22. (Previously Presented) The recording medium according to claim 1, wherein arrays of the wobbled pits and arrays of the straight pits in the control data area are of different length.

23. (Previously Presented) The recording medium according to claim 1, further comprising:

a main data area including main data recorded with modulation in straight pits formed along tracks.

24. (Currently Amended) The method according to claim 2, wherein the step of encoding control information encodes ~~the wobble shapes of~~ the wobbled pits by bi-phased modulation.

25. (Previously Presented) The method according to claim 15, wherein the step of encoding control information repeatedly encodes the same protection information in plural arrays of the wobbled pits.

26. (Previously Presented) The method according to claim 2, wherein the control data area comprises arrays of the wobbled pits and arrays of the straight pits periodically.

27. (Previously Presented) The method according to claim 2, wherein the step of forming pits forms arrays of the wobbled pits and arrays of the straight pits having different lengths respectively in the control data area.

28. (Previously Presented) The method according to claim 3, wherein the step of detecting control information detects the control information recorded in the wobbled pits by bi-phased modulation, in the control data area.

29. (Previously Presented) The method according to claim 3, wherein the step of detecting pits detects arrays of the wobbled pits and arrays of the straight pits having different lengths respectively in the control data area.

30. (Previously Presented) The recording medium according to claim 1, wherein the wobbled pits are formed in more than two data units different from a first data unit.

31. (Previously Presented) The recording medium according to claim 30, wherein the plurality of data units comprise one address unit, and the wobbled pits are formed in more than two data units different from the first data unit within the address unit.

32. (Previously Presented) The recording medium according to claim 31, wherein the wobbled pits are formed in a plurality of address units.

33. (Previously Presented) The method according to claim 2, wherein the step of forming pits forms the wobbled pits in more than two data units different from a first data unit.

34. (Previously Presented) The method according to claim 33, wherein the step of forming pits includes comprising the plurality of data units into one address unit, and wherein the wobbled pits are formed in more than two data units different from the first data unit within the address unit.

35. (Previously Presented) The method according to claim 34, wherein the wobbled pits are formed in a plurality of address units.

36. (Previously Presented) The method according to claim 3, wherein the step of detecting control information includes detecting the wobbled pits formed in more than two data units different from a first data unit.

37. (Previously Presented) The method according to claim 36, wherein the plurality of data units comprise one address unit, and wherein the step of detecting control information includes detecting the wobbled pits formed in more than two data units different from the first data unit within the address unit.

38. (Previously Presented) The method according to claim 37, wherein the wobbled pits are formed in a plurality of address units, and wherein the step of detecting control information includes detecting the wobbled pits formed in the plurality of address units.

39. (Currently Amended) The apparatus according to claim 9, wherein the detection unit is configured to detect the wobbled pits formed in more than two data units different from a first data unit.

40. (Currently Amended) The apparatus according to claim 39, wherein the plurality of data units comprise one address unit, and wherein the detection unit is configured to detect the wobbled pits formed in more than two data units different from the first data unit within the address unit.

41. (Currently Amended) The apparatus according to claim 40, wherein the wobbled pits are formed in a plurality of address units, and

wherein the detection unit is configured to detect the wobbled pits formed in the plurality of address units.